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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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03/24/2000

Shinji Imai

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7590

07/22/2004

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EXAMINER

LEE, SHUN K


ART UNIT

PAPER NUMBER

2878

DATE MAILED: 07/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/534,204	IMAI ET AL.	
	Examiner	Art Unit	
	Shun Lee	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2003 and 05 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 59, 62 and 64-66 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 59, 62 and 64-66 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5 May 2004 has been entered.

Election/Restrictions

2. Applicant's election without traverse of species I (claims 1-8) in Paper No. 12 has been acknowledged.

Drawings

3. The drawings were received on 22 September 2003. These drawings are acceptable.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-4, 5-8, 59, 62, and 64-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Karellas (US 5,864,146) in view of Perez-Mendez (US 5,596,198) and Takahashi *et al.* (US 5,059,794).

In regard to claims **5-7** and **65**, Karellas discloses (Fig. 37) an image read-out system comprising:

- (a) a stimulating light source (1302) which emits stimulating light (1310) in a wavelength range of not shorter than 600 nm (column 34, lines 54-63),
- (b) a stimulating light scanning means which causes the stimulating light (1310) emitted from the stimulating light source to scan (column 34, lines 54-56) a stimuable phosphor sheet (1306) having a layer of stimuable phosphor which emits stimulated emission in a wavelength range not longer than 500 nm (column 35, lines 1-8) in proportion to the stored energy of radiation upon exposure to the stimulating light (1310),
- (c) a solid image sensor (electronic area detector 1312) having a photoconductive material layer the major component of which is a-Se (*i.e.*, amorphous selenium; column 40, lines 1-9) and which exhibits electric conductivity upon exposure to the stimulated emission from the stimuable phosphor sheet (1306), and

(d) an image signal obtaining means (*i.e.*, pixelated readout; column 40, lines 1-9) which detects electric charges generated in the photoconductive material layer of the solid image sensor (electronic area detector 1312) when the stimuable phosphor sheet (1306) is exposed to the stimulating light (1310) and stimulated emission emitted from the stimuable phosphor sheet (1306) impinges upon the photoconductive material layer, and detects an image signal representing an image stored on the stimuable phosphor sheet (1306).

While Karellas also discloses (Fig. 5) that an image sensor comprises pixels disposed in a first direction and a second direction perpendicular to the first direction, wherein the pixels disposed in the first direction are separated by a pixel element pitch, so that each pixel in the first direction is in a one-to-one correspondence with a picture element and (column 40, lines 1-9) obtaining an image signal by pixelated readout of the amorphous selenium image sensor, the system of Karellas lacks that a pixel comprises of a spaced apart electrode and wherein an electric voltage imparting means which imparts an electric voltage to a 1 μm to 100 μm (or 10 μm to 50 μm) thick photoconductive material layer so as to apply an electric field which generates an avalanche amplification effect in the photoconductive material layer of the solid image sensor during impingement of the stimulated emission. However, pixelated readout of photoconductive image sensors is known in the art. For example, Perez-Mendez teaches (Figs. 2 and 5; column 6, lines 57-67) that a-Se image sensors comprises a rectangular array of spaced apart pixel electrodes. Further, a-Se photoconductive material layer properties are well known in the art. For example, Takahashi *et al.* teach (column 2, lines 18-22 and 47-58; column

6, lines 15-39) to apply an electric field to an a-Se photoconductive material layer (e.g., 2 μm thick; column 6, lines 15-39) sufficient for avalanche amplification in order to increase optical detection sensitivity when using a laser stimable phosphor. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to apply a sufficient electric field to (e.g., a 2 μm thick) a-Se photoconductive material layer at each spaced apart pixel electrode in the system of Karellas during pixelated readout, in order to increase optical detection sensitivity as taught by Takahashi *et al.*

In regard to claims **1-3**, **62**, **64**, and **66**, the method steps are implicit for the modified apparatus of Karellas since the structure is the same as the applicant's apparatus of claims 5-7 and 65.

In regard to claim **4** (which is dependent on claim 1) and claims **8** and **59** (which are dependent on claim 5), the system of Karellas lacks a fluctuation suppressing means that suppresses image signal fluctuations due to fluctuation in the electric field applied to the photoconductive material layer (e.g., by correcting the image signal according to applied electric field fluctuations from voltage power source fluctuations). However, photoconductor quantum efficiency (η) as a function of applied electric field (E) is well known in the art. For example, Takahashi *et al.* (Fig. 3) teach that there is a steep increase in quantum efficiency (η) when the applied electric field (E) increases. In addition it is important to recognize (see for example Eq. 4 of Takahashi *et al.*) that quantum efficiency (η) denotes efficiency for conversion of light (L) into charge (Q). Thus Q is proportional to η which is a function of both L and E and image signal

$S = g(Q) = g(h_A(L_E, E)) = f_A(L_E, E)$. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a fluctuation suppressing means (e.g., $S = f_A(L_E, E)$) in the system of Karellas, so that the image signal (S) is indicative of the stimulated emission (L_E) and thus representative of the image stored on the stimuable phosphor sheet.

Response to Arguments

7. Applicant's arguments with respect to the amended claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion


8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (571) 272-2439. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Art Unit: 2878

SL


CONSTANTINE HANNAHER
PRIMARY EXAMINER
GROUP ART UNIT 2878